



**CITY OF MARLBOROUGH**  
*Department of Public Works*  
*Forestry, Parks, & Cemetery Division*  
135 Neil Street  
Marlborough, Massachusetts 01752  
(508) 624-6910  
Facsimile (508) 624-7699 TDD (508) 460-3610

## **YEARLY OPERATIONAL PLAN 2021**

Prepared and submitted by:

Christopher White,  
General Foreman  
Forestry, Parks & Cemeteries Division  
City of Marlborough  
Department of Public Works  
135 Neil Street  
Marlborough, MA. 01752

January 10, 2021

City of Marlborough  
2021 Yearly Operational Plan

## Table of Contents

### Title Page No.

Cover	
Table of Contents	
Program Purpose .....	1
Individual Supervising YOP .....	3
Municipal Department Performing Herbicide Treatment .....	4
Herbicide(s) Proposed .....	5
Herbicide Application Techniques and Alternative Control Proposed.....	6-7
Target Vegetation.....	8
Description of Methods Used to Flag or Otherwise Designate Sensitive Areas .....	9
Procedures & Locations for Handling, Mixing & Loading of Herbicide Concentrates .....	11
Remedial Plan to Address Spills and Related Accidents .....	11
Emergency Contacts .....	12

## Appendices

A- Locus map	
B-Herbicide Fact Sheets Web Site	
C- Labels Web Site	
D- U.S.G.S. Quadrangle Map	
E- Floodplain & Wetlands Protection District Map with Sensitive Areas	
F- Narrative of Sensitive Area Boundaries	
G- Municipal Sign off letters from Chief Elected Official (Mayor), Board of health	
H-Daily Vegetation report	

## **Program Purpose**

The purpose of 333 CMR 11.00, Right of Way Management, is to promote the implementation of integrated pest management techniques and to establish standards requirements and procedures necessary to minimize the unreasonable adverse effects on human health and the environment associated with the use of herbicides to maintain streets. These regulations establish procedure, which guarantee ample opportunity for public and municipal agency review and input on the right-of-way maintenance plans.

A Yearly Operational Plan or YOP must be submitted to the Department of Agricultural Resources (Department) every year herbicides are intended for use to maintain rights-of-ways (ROW). The YOP provides a detailed program for vegetation management for the year. A five-year Vegetation Management Plan (VMP) has been approved by the Department and is available for review at the Board of Health, Conservation Commission, and office of the chief-elected official of the municipality.

Upon receipt of this YOP, the Department publishes a notice in the Environmental Monitor. The applicant must provide a copy of the proposed YOP and Environmental Monitor notice to the Board of Health, Conservation Commission, and the chief-elected municipal official for the city or town in which the herbicide treatment is proposed. The Department allows a 45-day comment period on the proposed YOP beginning with publication of the notice in the Environmental Monitor and receipt of the YOP and Environmental Monitor notice by each municipality.

Public notification and herbicide application to the streets is made at least 21 days in advance of the treatment by a separate notice. Notice is made to the Department of Food and Agriculture, the Mayor, City Manager or Chairman of the Board of Selectman, the Board of Health, and the Conservation Commission of the municipality where the streets lie.

Any comments on this YOP should be directed to the contact person listed herein as the person/s supervising the YOP or person/s performing the treatment.

This Yearly Operational Plan, approved by the Department of Agricultural Resources pursuant to the Rights of Way Management Regulations (333 CMR 11.00), has been adopted by the following municipality and agency. As the representative of the municipality and agency, the undersigned hereby acknowledges that the conditions of this Yearly Operational Plan, approved by the Department of Food and Agriculture pursuant to the Right-of –Way Management Regulations (333 CMR 11.00) has been adopted by the City of Marlborough. The undersigned hereby acknowledges that the conditions of this Yearly Operational Plan will be adopted and complied with.

MUNICIPALITY	City of Marlborough
NAME	Christopher White
AGENCY	Marlborough Department of Public Works
ADDRESS	135 Neil Street Marlborough, MA. 01752
TELEPHONE	(508)-624-6910 ext.33601
Email:	<a href="mailto:cwhite@marlborough-ma.gov">cwhite@marlborough-ma.gov</a>
SIGNATURE	_____
DATE	_____

Signature of conservation official acknowledging that wetlands in the municipality have been delineated.

CONSERVATION OFFICER	Priscilla Ryder	
SIGNATURE	_____	Date:_____

## Individual Supervising YOP

Individual supervising implementation and conditions of the YOP

Name and Title: Christopher White  
General Foremen Forestry, Parks & Cemeteries  
Division  
L#31061

Department: Department of Public Works

Address: 135 Neil Street  
Marlborough, MA. 01752

Telephone Number: (508)624-6910 ext. 33601

Signature: \_\_\_\_\_  
Christopher White

## **Municipal Department Performing Herbicide Treatment**

Herbicide treatment will be performed by City of Marlborough Department of Public Works employees. Applicators are certified by the Department of Food and Agriculture in the applicator category. Copies of certifications are on file at the Department of Public Works.

Name and Title: Christopher White,  
General Foremen, Forestry, Parks & Cemeteries  
Division

Licensed Applicator: TBD

Department: Department of Public Works

Address: 135 Neil Street  
Marlborough, MA. 01752

Telephone Number: (508)624-6910 ext.33601

Signature: \_\_\_\_\_  
Christopher White

## Herbicides Proposed Including Application Rates, Carriers, Adjuvants

Herbicides that may be used on municipal roadways are limited to the following:  
Chemicals For Use Around Sensitive Areas:

<u>Trade Name</u>	<u>EPA reg. No.</u>	<u>Active Ingredients</u>	<u>Guidelines</u>
Roundup Pro	524-475	Glyphosate	See Label
Oust Extra	352-622	Sulfometuron Methyl	
		Metsulfuron Methyl	See Label
Garlon 4	62719-040	Triclopyr 3,5,6 trichloro 2	
		Pyridinyloxyacetic	
		butoxyethyl ester	See label
Arsenal	241-431	Isopropylamine salt	
		Imazapyr	See Label

### Chemicals For Use Outside of Sensitive Area (Generic)

<u>Trade Name</u>	<u>EPA reg. No.</u>	<u>Active Ingredients</u>	<u>Guidelines</u>
Roundup			
QuikPRO	524-535	Glyphosate/Diquat dibromide	See Label
Roundup			
PROMax	524-579	Glyphosate	See label
Scythe	62719-529	Pelargonic Acid	See Label

### Tank Mixed Adjuvants:

<u>Trade Name</u>	<u>EPA reg. No.</u>	<u>Active Ingredients</u>	<u>Guidelines</u>
Microyl		Paraffin base Petroleum	See Label
		Oil, Sufactant Blend	
LI 700		Methylacetic acid	See label
		Phosphatidylcholine,	
		alkyl polyoxyethylene ether	

The names and active ingredients of the herbicides proposed and the names of any carriers, adjuvant or additives to be used. Herbicide Fact Sheets/Labels for the Herbicides proposed are found in Appendices.

<u>Control Method</u> <u>Application %/ acre</u>	<u>Herbicide(s) Mixture %</u>	<u>Carriers/Adjuvant</u>
Foliar Treatment Per Label	Glyphosate per label Sulfometuron Methyl Metsulfuron Methyl 2.33/3oz-Acre Diquat dibromide Pelargonic Acid Triclopyr Imazapyr	Listed above

### **Herbicide Application Techniques and Alternative Control Procedures**

The herbicide(s) will be applied in accordance with the instructions in the attached manufacturer's information. Alternative control procedures, applicable at the designated "No Spray Zones" will consist of hand cutting, mowing, or selective trimming (mechanical). Other alternative controls will include routine street sweeping along with crack and road repairs.

#### **Foliar Treatment**

Foliar treatments involve the selective application of an herbicide diluted in water, to the foliage. Several types of equipment for foliar treatments may be used. These could include: backpack sprayers, hand-held pump sprayers or a motorized truck-mounted sprayer. Foliar treatments with backpack and hand-held pump sprayers are used on low-density target vegetation. The herbicide solution will be diluted to the lowest possible percent that will provide effective control of target species. Motorized application equipment may be used for foliar treatment on areas where the vegetation density is high and the use of a backpack spray may not be as effective. In both cases, the herbicide solution is applied to lightly wet the target plant/ target area. These techniques have few limitations with the exception being reduced effectiveness on tall, high-density target vegetation and will not be used on vegetation over 12 feet in height.

#### **Cut Stump Surface Treatment**

Cut stump treatments consist of mechanical cutting of target species using chain saws followed by herbicide treatment applied with a squirt bottle, a hand pump sprayer, or painted on the freshly cut surface of the stump. The cutting procedure is identical to that outlined in the Hand Cutting section of this VMP. Cut stump application can be effective during the dormant period, however may not be effective during times of sap flow (i.e., maples and birches during the months of February through early April), as flowing sap will limit the herbicide from being absorbed into the stump down to the roots. Certain

types of herbicide formulations are limited to freshly cut stumps to be effective. Cut stump treatments will generally be performed to trees greater than 12' tall and re-sprout. All equipment used for vegetation management programs must be maintained in good working condition and should be of adequate design and ability to produce the professional quality of work that the City requires. Because the City recognizes the vast variety and performance of herbicide application equipment, dictating how that equipment should be calibrated to deliver precise amounts of herbicide to effectively control a host of vegetation conditions is difficult. Therefore, the City insists that the applicator provide the most appropriate application equipment, calibrated to effectively and legally control target vegetation.

Both the applicator and/or the City are responsible to ensure that vegetation management activities are conducted in a professional, safe, efficient manner, with special attention directed towards minimal environmental impact. The applicator is qualified, licensed and certified to apply herbicides. "Qualified" means those personnel who have been trained to recognize and identify target and non-target vegetation and are knowledgeable in the safe and proper use of both mechanical and chemical vegetation management techniques. All personnel applying herbicides in Massachusetts must be licensed in the Commonwealth and must work under the on-site supervision of a certified applicator. All contract personnel will also follow all Label instructions regarding Personal Protective Equipment (PPE).

The City will rely on the applicator listed in the YOP for vegetation management applications and requires that applicators comply with all applicable federal and state laws and regulations. These include, but are not limited to, applicable OSHA, FIFRA and DOT regulations, 333 CMR 1-15.00, Rights-of-Way Management, Chapter 132B, Chapter 85 of the Acts of 2000 and 321 CMR 10.00 as managed by NHESP.

Herbicides will only be applied in a safe and judicious manner, in compliance with all-applicable State and Federal pesticide regulations.

Applicators will at all-time exercise good judgment and common-sense during herbicide treatment activities, and will immediately cease operations if adverse conditions or other circumstances warrant.

Herbicides will NOT be applied during the following adverse weather conditions:

- A. During high wind velocity, per 333 CMR 11.03
- B. Foliar applications during periods of dense fog, or moderate to heavy rainfall
- C. Foliar applications of volatile herbicides during periods of high temperatures (90 plus degrees Fahrenheit) and low humidity
- D. Cut Stump applications when deep snow (i.e. 6" plus or ice frozen on stem or stump) prevents adequate coverage of target plants to facilitate acceptable control

The applicator or a representative of the City must complete daily vegetation management reports that include:

- A. Date, name and address of vegetation management applicator(s)
- B. Identification of site or work area
- C. List of crew members

City of Marlborough  
2021 Yearly Operational Plan

- D. Type of equipment and hours used, both mechanical and chemical
- E. Method of application and description of target vegetation
- F. Amount, concentration, product name of herbicide(s), adjuvants, and dilutants (EPA registration numbers must be on file)
- G. Weather conditions
- H. Notation of any unusual conditions or incidents, including public inquiries
- I. Recording and/or verification of sensitive areas on ROW maps

A Daily Vegetation Management Form is included in Appendices

## **Target Vegetation**

The target vegetation for this YOP will include hazard, detrimental, and nuisance vegetation.

Vegetation management crews will exercise care to ensure that low-growing desirable vegetation and other non-target organisms are not unreasonably affected by the application of herbicides.

### Hazard Vegetation

Hazard vegetation poses a risk to public safety and represents vegetation that impedes movement along public ways. Hazard vegetation may obscure sightlines, obscure signs, obscure vehicular movement, create windfall hazards, block storm drains and cause winter shading (causing ice/reduced melting). Hazard vegetation may include but is not limited to trees, tree limbs and shrubs.

### Detrimental Vegetation

Detrimental vegetation includes grasses and woody plants that are destructive or compromise the function of infrastructure by growing in cracks along the roadway, pavement/bridge joints, medians/traffic islands, and drainage structures/drainage ways.

### Nuisance Vegetation

This category includes vegetation that could cause problems to the general public, employees or contractors and generally include poisonous and noxious plant species. Nuisance vegetation poses a risk to safety and health often due to dermal contact with plants that are poisonous, heavily-thorned or densely colonized. Target vegetation in this category is primarily Poison Ivy and other nuisance vegetation within 10 feet of the edge of pavement.

**Description of Methods Used to Flag or Otherwise Designate Sensitive Areas**

Sensitive areas as defined by 333 CMR 11.04 are “any areas within Rights-of-Way, including No-Spray and Limited Spray Areas, in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects.”

The attached map identifies ‘Sensitive Areas Not Readily Identifiable in the Field. With this map and the assistance of the Conservation Commission Agent, sensitive areas will be identified and marked along the ROW prior to any herbicide application. Field Methods will include flagging and/or roadway marking (via paint) of start and stop areas.

“No Spray Zones” have been marked by personnel under the director of the Conservation Officer.

Personnel have been given lists of sensitive areas to be kept in vehicles used in the vegetation control operation

The lists also have the closest permanent marker used to define the boundary limits of sensitive areas (i.e. Telephone pole #'s, building numbers, or road location with distance from culverts or bordering wetland vegetation).

Appendix F provides a narrative of the boundaries to the sensitive “no spray zones” that have been marked on the Flood plains and Wetlands Protection District Map.

### Sensitive Area Restrictions (333 CMR 11.04)

<b>Sensitive Area</b>	<b>No Spray Zone</b>	<b>Limited Use Zone</b>	<b>Where Identified</b>
Wetlands and Water Over Wetlands	Within 10 feet	10 – 100 feet; 12 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps and identify on site
Certified Vernal Pool	Within 10 feet	10 feet to the outer boundary of any Certified Vernal Pool Habitat; 12 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps and identify on site
Public Ground Water Supply	Within 400 feet (Zone I)	Zone II or IWPA (Primary Recharge Area); 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps
Public Surface Water Supply	Within 100 feet of any Class A public surface water source	100 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps
	Within 10 feet of any tributary or associated surface water body located outside of the Zone A	10 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	
	Within 100 feet of any tributary or associated surface water body located within the Zone A of a Class A public surface water source		

<b>Sensitive Area</b>	<b>No Spray Zone</b>	<b>Limited Use Zone</b>	<b>Where Identified</b>
	Within a lateral distance of 100 feet for 400 feet upstream of any Class B Drinking Water Intake	Within a lateral distance of between 100 - 200 feet for 400 feet upstream of intake; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	
Private Water Supply	Within 50 feet	50 – 100 feet; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	In YOP well list and identify on site
Surface Waters	Within 10 feet from mean annual high-water line	10 feet from the mean annual high-water line and the outer boundary of the Riverfront Area; 12 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps and identify on site
Agricultural and Inhabited Areas	N/A	0 – 100 feet 12 months must elapse between application; Selective low pressure, using foliar techniques or basal or cut-stump applications.	Identify on site
State-listed Species Habitat	No application within habitat area except in accordance with a Yearly Operational Plan approved in writing by the Division of Fisheries and Wildlife		YOP Maps

## **Procedures and Locations for Handling, Mixing and Loading of Herbicide Concentrates**

The herbicide will be mixed in the controlled environment at the Marlborough Public Works Garage located at 135 Neil Street in Marlborough.

Although it is expected that all the mixed herbicide will be used, any remaining will be stored at the Marlborough Public Works Garage in accordance with manufacturer's instructions. The absorbent product "Speedi-Dri" will be available for use at the locations of application. If there is a leak in the hose, the pump will be immediately shutoff.

Equipment used will be washed at the Marlborough Public Works Garage.

Herbicides will be handled and applied only in accordance with the label instructions.

Applicators will strictly adhere to all mandated safety precautions directed towards the public, the applicator and the environment.

## **Remedial Plan to Address Spills and Related Accidents**

All mixing and loading of herbicides will be conducted at the Marlborough Public Works Garage where the herbicides are stored. Only the amount of herbicide necessary to carry out the vegetation control, based on monitoring results, will be mixed to ensure that there will be no waste and minimize potential problems. The vehicles carrying out the spray operations will be equipped with a bag of absorbent, activated charcoal, leak-proof containers, a broom and a shovel in case of minor spills. A clipboard log of the herbicides on the vehicle will be kept on the vehicle. Herbicide labels and fact sheets will be carried on-site by the applicator.

As soon as any spill is observed, immediate action will be taken to contain the spill and protect the spill area. The cause of the spill must be identified and secured. Spill containment will be accomplished by covering the spill with absorptive clay or other absorptive material or, for large spills, building clay or soil dikes to impede spill progress. Until completely remediated, the spill area will be protected by the placement of barriers and by the delineation of the spill area by crew members. If a fire is involved, care will be taken to avoid breathing fumes from any burning chemicals.

Minor spills will be remedied by soaking up the spill with adsorption clay or other adsorptive material and placing it in leak proof containers, removed from the site and disposed of properly. Dry herbicides, such as granular, will be swept up or shoveled up directly in leak proof containers for proper disposal. All contaminated soil will be placed in leak proof containers, removed from the site and disposed of properly. Activated charcoal will be incorporated into the soil at the spill location per label instructions. Any minor spill will be reported to the Department of Agricultural Resources.

Major spills will be handled in a similar manner as minor spills, except in cases where the spill cannot be contained and/or removed by the crew. In this case the MassDEP Incident Response Unit and the Department of Agricultural resources must be contacted.

Emergency first responders (including but not limited to fire and police) will be immediately notified of a major spill and/or any size incident deemed a possible risk to public health, safety and the environment.

MassDEP will be contacted when there is a spill of a regulated quantity, regardless of major or minor spill status and in accordance with 310 CMR 40.0000 Massachusetts Contingency Plan.

### **Emergency Contacts**

In the event of a spill, information on safety precautions and clean up procedures may be gathered from the following sources:

Herbicide label

Herbicide MSDS sheet

Herbicide Manufacturer

DOW (800) 992-5994

Dupont (800) 441-3637

Monsanto (314) 697-4000

NuFarm (877) 325-1840

Massachusetts Department of Agricultural Resource (617)626-1781

Massachusetts Department of Environmental Protection

Emergency Response (888) 304-1133

Department of Public Health

Environmental Toxicology Program (617) 624-5757

Massachusetts Poison Control Center

24-Hour Hotline (800) 222-1222

Chemtrec (800)424-9300

EPA Pesticide Hotline (800)858-7378

Massachusetts Poison Control Center (800)682-9211

City of Marlborough Public Works (508)624-6910

Marlborough Fire Department (508)481-2323 or 911

Marlborough Police Department (508)485-1212 or 911

National Pesticide Information Center (800)-858-7378

National Animal Poison Control Center (888)-426-4435

# **APPENDICES**

# **Appendix A**

## Locus Map

## **Appendix B**

Herbicide Fact Sheets as Approved by the Department of Agricultural Resources  
Located at:

<https://www.mass.gov/service-details/rights-of-way-sensitive-area-materials-list>



# THE COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS



## Department of Agricultural Resources

251 Causeway Street, Suite 500, Boston, MA 02114  
617-626-1700 fax: 617-626-1850 [www.mass.gov/agr](http://www.mass.gov/agr)



### SULFOMETURON METHYL

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: <http://www.fs.fed.us/foresthealth/pesticide/risk.shtml>

**Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts**

COMMON TRADE NAME(S): Oust

CHEMICAL NAME : N-[4,6-dimethylpyrimidin-2-yl] amino-carbonyl -2-methoxycarbonylbenzenesulfonafuide

CAS NO: 74222-97-2

### GENERAL INFORMATION

Sulfometuron methyl, the active ingredient in the herbicide Oust, is a member of the group of sulfonylurea herbicides. Sulfometuron Methyl is a broad-spectrum selective weed control agent used in non-crop areas. Oust is applied pre- or post-emergence which provides control against many broad-leaf weeds and grasses through contact and residual activity. (15)

### ENVIRONMENTAL FATE

#### Mobility

The mobility of sulfometuron methyl has been reported in literature and the database available is complete. Sulfometuron methyl is a weak acid (pKa 5.2) and consequently, adsorption coefficients were calculated for various soils at pH values of 5, 6, and 7. In a low organic matter I soil (1%) the adsorption coefficients were 2.0, 0.8 and 0.3 at the respective pH values. This study indicates that sulfometuron methyl is more strongly adsorbed to soil as the pH decreased, and as organic matter increases. (15)

Soil thin layer chromatography and adsorption coefficients were performed and calculated for four standard soils. Kd values ranged from 0.71 to 2.85 and Rf values ranged from 0.33 to 0.85 indicated a moderate mobility. In addition, soil column studies using the same four soils indicate a moderate to moderately high mobility pesticide. Koc values calculated from the soil Kd values range from 61 to 122 which is lower than the EPA guideline of 400. (101)

# THE COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS



## Department of Agricultural Resources

251 Causeway Street, Suite 500, Boston, MA 02114  
617-626-1700 fax: 617-626-1850 [www.mass.gov/agr](http://www.mass.gov/agr)



### METSULFURON METHYL

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: <http://www.fs.fed.us/foresthealth/pesticide/risk.shtml>

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Names: Escort, Escort XP (2)

Chemical Name: Methyl 2 E[C[(4-Methoxy—6-methyl-1,3,5-Triazifl—  
2-yl) aminolcarbonyl] amino] sulfonyl.]benzoate] (9)

CAS NO.: 74223-64-6

### GENERAL INFORMATION

Metsulfuron methyl is a sulfonyl urea herbicide initially registered by E.I. DuPont in 1986. It is a foliar herbicide registered for use on wheat and barley and non-cropland sites such as Right of Way (9).

### ENVIRONMENTAL FATE

#### Mobility

Metsulfuron methyl is a relatively new herbicide. The studies reviewed here have been provided by the registrant, EI DuPont.

The soil water partition coefficients (Kd) of Metsulfuron Methyl have been determined in four different soils: Cecil sand, Flanagan silt loam, Fallsington silt loam, and keyport silt loam. The Kd values range from 0.36 for Cecil sand to 1.40 for Flanagan silt loam, and Kom values ranged from 29 for Fallsington silt loam to 120 for Cecil sand (100). The values for Kd and Kom indicate that metsulfuron methyl is not adsorbed well to soil and that the organic content of the soil is not the only adsorption component. The silt and clay contents appear to influence adsorption, but there are probably other factors also involved.

The previous study also determined the Rf values for soil. Thin layer chromatography was performed on four soils for metsulfuron methyl. The Rf values ranged from 0.64 to 1.00; only one value was less than 0.90 (100). This result confirms the validity of the Kd values, indicating that metsulfuron methyl is mobile and that the organic matter content of the Soil is a significant component of adsorption.

Metsulfuron methyl was applied to tops of 12 inch columns [containing four different soils], and eluted with 20 inches of water in 20 hours. Following the percolation of the total volume of water, 106% of the metsulfuron

# THE COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS



## Department of Agricultural Resources

251 Causeway Street, Suite 500, Boston, MA 02114  
617-626-1700 fax: 617-626-1850 [www.mass.gov/agr](http://www.mass.gov/agr)



### GLYPHOSATE

In addition to the review that is presented below, a comprehensive review available from USDA Forest Service provides information that incorporates more recent studies and data. The US Forest Service risk assessment report is available at: <http://www.fs.fed.us/foresthealth/pesticide/risk.shtml>

Review conducted by MDAR and MassDEP for use in Sensitive Areas of Rights-of-Way in Massachusetts

Common Trade Name(s): Roundup, Glyphosate VMF Round Up Pro, Rodeo, Accord, Accord Concentrate,

Chemical Name: N—(phosphonomethyl)glycine—isopropylamine salt  
CAS No.: 1071-83-6

#### GENERAL INFORMATION

Glyphosate, n-phosphonomethyl glycine, is a systemic, broad spectrum herbicide effective against most plant species, including deep rooted perennial species, annual and biennial species of grasses, sedges, and broadleaved weeds. The major pathway for uptake in plants is through the foliage, however, some root uptake may occur. The presence of surfactants and humidity increases the rate of absorption of glyphosate by plants (15).

Foliarly applied glyphosate is readily absorbed and translocated from treated areas to untreated shoot regions. The mechanism of herbicidal action for glyphosate is believed to be inhibition of amino acid biosynthesis resulting in a reduction of protein synthesis and inhibition of growth (10, 15, 101).

Glyphosate is generally formulated as the isopropylamine salt in aqueous solution (122). Of the three products containing glyphosate considered here, Roundup is sold with a surfactant and Rodeo and Accord are mixed with surfactants prior to use (15). Glyphosate has been reviewed by US Forest Service (15), FAO (122), and EPA 00W (51).

#### ENVIRONMENTAL FATE

##### Mobility

Glyphosate is relatively immobile in most soil environments as a result of its strong adsorption to soil particles. Adsorption to soil particles and organic matter begins almost immediately after application. Binding occurs with particular rapidity to clays and organic matter (15). Clays and organic matter saturated with iron and aluminum (such as in the Northeast) tend to absorb more glyphosate than those saturated with sodium or calcium. The soil phosphate level is the main determinant of the amount of glyphosate adsorbed to soil particles. Soils which are low in phosphates will adsorb higher levels of glyphosate (14, 15).

Glyphosate is classified as immobile by the Helling and Turner classification system. In soil column leaching studies using aged (1 month) Glyphosate, leaching of glyphosate was said to be insignificant after 0.5 inches of water per day for 45 days (14).

## **Appendix C**

Product Labels/SDS's

## Sensitive Area Products

Oust Extra

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/13819>

Roundup Pro

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/854>

Garlon 4 Ultra

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/8141>

Arsenal Powerline

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/8719>

## Chemicals For Use Outside of Sensitive Area (Generic)

Roundup Quikpro

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/11400>

Roundup PROMAX

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/9278>

Scythe

<http://www.cdms.net/Label-Database/Advanced-Search#Result-product/878>

## Tank Mixed Adjuvants

Microyl

<https://www.reinders.com/products/chem-microyl/>

Li-700

<https://www.lovelandproducts.com/product/li-700>

[https://www.agrian.com/labelcenter/results.cfm?show\\_product=281](https://www.agrian.com/labelcenter/results.cfm?show_product=281)

## **Appendix D**

U.S.G.S Quadrangle Map

## **Appendix E**

Floodplain & Wetlands Protection District Map with Sensitive Areas

# **Appendix F**

## Narrative of Sensitive Area Boundaries

## **Appendix G**

Municipal Sign off Sheets of Chief Elected Official (Mayor)  
Board of Health

# **Appendix H**

## Daily Vegetation Report

## **DAILY VEGETATION MANAGEMENT REPORT**

**DATE:**

**APPLICANT:**

**ADDRESS:** 135 Neil St., Marlborough MA 01752

**CREW MEMBERS:** Auger, DeMarco

**MECHANICAL CONTROL/HRS:** #72 Alamo Roadside Cutter (Auger) 8hr

**LOCATION:** Berlin West Hill RD Area cutting woody vegetation, Poison Ivy, Grassy Weeds within six feet of ROW

**CHEMICAL CONTROL:** Connolly, DeMarco

**LOCATION:** : Island on Granger Blvd, and South Bolton, Mill, Island South St, South St ext, Newton, Florence, Court, Cotting, Ames, Granger, Bridge, John, Howe, Zompetti, Maple , Bolton St Ext, Valley, Weed, Lacombe, Howe, Hildreth, Rawlins

**AMOUNT:** 9 Gallons Solution

**CONCENTRATION:** 1.5 oz/Gal. 13.5 oz total

**PRODUCT:** Roundup Pro

**EPA Reg#:** 524-475

**METHOD of APPLICATION/TARGET:** Low Pressure hand held sprayers application made to gutter and curbing areas to control grasses in cracks. Poison Ivy, Japanese Knot Weed along road edge and guard rails on Ames, South St, South St Ext.

**WEATHER:** Sunny 80's

**SENSITIVE AREAS:** None listed or shown on YOP Maps

**NOTES:** Spraying started at 5:30 am Concluded at 11:30 am

**DATE:**

**APPLICANT:**

**ADDRESS:**

**CREW MEMBERS:**

**MECHANICAL CONTROL/HRS:**

**LOCATION:**

**CHEMICAL CONTROL:**

**LOCATION:**

**AMOUNT:**

**CONCENTRATION:**

**PRODUCT:**

**EPA Reg#:**

**METHOD of APPLICATION:**

**WEATHER:**

**SENSITIVE AREAS:**

**NOTES:**

